WILDLIFE; MANAGEMENT INDICATOR HABITATS

Monitoring Questions

1. *To what extent is Forest management moving toward short term (10-20 years) and long-term (100 years) objectives for habitat conditions for management indicator species and species associated with management indicator habitats?* ***2.*** *Are the MIH current conditions consistent with Forest Plan Decade and expected conditions analyzed in the Forest Plan FEIS (Chapter 3.3.1)?* ***3.*** *Do FEIS (Chapter 3.3.1) conclusions about effects to habitats, populations, and species viability and well distributed habitats remain valid in 2006?*

Monitoring Conducted

Desired Conditions. *D-WL-1-9.* ***Forest Wide Objectives;*** *O-WL-1-3, O-WL-16, 17, 31, 32, 34, 35, 36.* ***LE MIH objectives*** *1-9.* ***Federal Regulations.*** NFMA 36CFR 219.19(a)

Overview

This section addresses conditions of Management Indicator Habitats (MIH) 1-9 on the Superior National Forest (SNF). MIH's are defined by their forest types and ages. Analysis of MIH 10 (Mature Upland Riparian Forest) and MIH 11(Forest Edge) was not conducted in 2006 because change to conditions was very minor. Analysis of amount of MIH 12 (Upland Interior Forest Habitat) and MIH 13 (Large Patches of Upland Mature Forest) is found in the Vegetation Resource section of this report. Evaluation of impacts to MIH 12/13 and their associated species will be conducted in future Monitoring and Evaluation Reports. MIH 14 (Lake and Stream Habitat) is addressed in the Aquatic MIH section of this report.

Forest Plan MIHs are "coarse filter" habitats that were identified and selected because they represent the major biological communities on SNF that are most affected by SNF management activities. The coarse filter management concept assumes that such representation will provide habitat for as many species as possible and provide a practical and efficient approach to addressing the thousands of species that are found on the SNF.

Course filter management is complemented with the "fine filter" management approach that addresses individual species. In the Forest Plan, fine filter species include Management Indicator Species (MIS), threatened, endangered and sensitive species (TES), and other species of interest.

Together, coarse and fine filter management also address direction to maintain viable populations of existing native and desired non-native vertebrate species in the planning areas (D-WL-3, p 2-27)

The SNF monitors coarse filter MIHs, together with population trends of MIS and other selected wildlife species, to help determine the effects of SNF management activities. MIHs are monitored on National Forest System lands at the Landscape Ecosystem (LE) scale which when combined provide the picture of habitat conditions across the entire SNF.

All MIHs are compatible with and complementary to LE vegetation and social objectives and with resources across the SNF including vegetation, watershed health, and wildlife found in Chapter 2 of the Forest Plan.

Forest Plan Appendix C (p. C-1 and C-2) provides the detailed descriptions of MIHs in terms of forest types and age groupings. Forest Plan Final EIS, Appendix B provides a more detailed discussion of how MIHs were selected.

MIH 1-9 Trends

This section monitors the changes that have occurred between 2004 (Forest Plan "Existing Condition") and 2006 and compares these to the objectives for the end of Decade 1. In future monitoring reports the SNF will be able to begin evaluating in terms of the Forest Plan Decade 2 objectives.

The amount, spatial distribution, and trend of MIHs 1-9 were monitored primarily by measuring forest vegetation conditions. Data for these are from the SNF's Combined Data System (CDS) vegetation inventory and its associated Geographic Information System (GIS) spatial data. Monitoring and evaluation of MIH data are displayed in several different ways for each Landscape Ecosystem:

- *General Trends for Management Indicator Habitats 1-9* provides a simple comparison of current 2006 conditions to Forest Plan objectives for the end of Decade 1 (2014). Evaluation addresses general information on those conditions that appear to not be trending in the desired condition.
- *Percent Change of Management Indicator Habitat 1 (Upland Forest)* provides more detailed data for MIH 1 – Upland Forest. This MIH is examined more closely because it is the aggregation of all upland forest types together and provides a useful index of Landscape Ecosystem-wide young and old forest conditions. Evaluation addresses basic monitoring questions for each Landscape Ecosystem.
- *Appendix D*. provides detailed data for MIHs by Landscape Ecosystem. This data is also available upon request in an excel spreadsheet format.

MIH 1-9 Associated Species Trends

An important element of MIH coarse filter management is monitoring associated species to attempt to validate assumptions and predictions about wildlife populations and habitat links. Species associated with each MIH are identified in Forest Plan FEIS Appendix D, Tables 9 and 12. The use of MIHs as surrogate measures acknowledges that habitat for each of the thousands of species is a unique combination of vegetation and other features that are often not readily detected by forest type and age alone. Moreover there are many complicating factors and scientific difficulties detecting relationships between habitat changes and species population trends. These include factors such as weather, climate change, changes in other parts of species' ranges (migratory or wintering), hunting and other human uses and influences, disease, forest insects and disease, non-native invasive species (NNIS), predation and others.

The evaluation of population trends or other indicators of species' presence will need to occur several years into Forest Plan implementation to allow population trends to be apparent under terrestrial and aquatic conditions projected under the Plan. In general, trends are better gauged and understood over time (decades) rather than annually. Nevertheless, the SNF and partners such as Minnesota DNR, Natural Resources Research Institute (NRRI) and other researchers will continue to work together and address the trends of individual species or guilds of species to provide insight into forest habitat conditions that may be affected by management activities within the SNF. In 2006, the SNF makes the assumption that there has been no significant change in species' populations or to environmental impacts assessed through the Revised Forest Plan due to SNF management in the first two years of implementation.

On an annual to five year basis the SNF and its partners are continuing to actively monitor or inventory a wide array of species. These ongoing monitoring efforts are as follows:

***Breeding forest birds*:** In partnership with the NRRI, Chippewa and Chequamengon-Nicolet National Forests, annual surveys have been conducted since on the SNF since 1991. In 2006 a total of 132, 133, and 164 stands (1,254 survey points) were surveyed for breeding birds in the Chequamegon-Nicolet, Chippewa, and Superior NFs, respectively. The surveys are conducted using timed point count listening in sampling locations distributed across the forest mosaic in a stratified random manner. These methods are described in detail in Etterson et al (2007).

Trends in relative abundance were calculated for 72 bird species, including 57 species in the Chequamegon NF, 57 in the Chippewa NF, and 49 in the SNF . Thirty-nine species were also tested for a pooled and more regional trend by combining data from the three national forests.

Analysis is also conducted by both individual species and three types of guilds: migration strategy (permanent resident or short- or long-distance migrants), nesting substrate (such as ground, cavity, canopy, or shrub/sub canopy) and vegetation-type preference (variety of habitat groups). The vegetation type guild can be cross-walked to SNF MIHs – though the SNF has not yet reported trends in this format. Many of the 49 species for which relative abundance has been calculated are associated with one or more of the MIHs.

The full report can be found on the NRRI website: (http://www.nrri.umn.edu/mnbirds/reports/2006_AnnualReport.pdf)

Terrestrial game species white-tailed deer, moose, ruffed and spruce grouse, snowshoe hare, wolf, beaver, otter, fox, black bears, American woodcock, waterfowl and many others are monitored annually. Each of these species is also linked or associated with one or more of the MIHs in Forest Plan Revision Final EIS (Vol. 2, Appendix D, pages D-26 to D-69**).** Monitoring of many of these species is conducted through a collaborative effort in which the SNF relies greatly on the Minnesota DNR and US Fish and Wildlife Service. Because monitoring Minnesota's wildlife is a collaborative effort, it is not specific to the proclamation boundary of the SNF. Nevertheless it is an applicable basis for SNF evaluation of impacts of management. The full report can be found at http://files.dnr.state.mn.us/publications/wildlife/populationstatus2006/populationstatus2006.pdf

In addition to the above species, the SNF, in partnership with others, monitors:

- Aquatic species: This includes species such as game and non-game fish, mollusks, and other invertebrates with the DNR taking the lead on monitoring many of these species.
- Frogs and toads: This is a State-wide long-term monitoring annual effort that tracks abundance, presence, and distribution of native frogs and toads.
- Non-native invasive species (numerous): The SNF tracks new and established colonies of species listed as low to high risk (FPR Final EIS, Vol. 1, p. 3.3.7-2) (See the Non-native Invasive Species section of the 2005 Superior National Forest Monitoring and Evaluation Report pp 76-84.).
- Regional Forester Sensitive Species (RFSS): Many RFSS are monitored through a variety of methods, though due to their rarity, population trends and management impacts, they are not always possible to reliably detect. Documentation for 27 RFSS can be found in the 2005 Monitoring and Evaluation Report (Wildlife: Regional Forester Sensitive Species section of the 2005 Superior National Forest Monitoring and Evaluation Report).
- The three species listed in 2006, lynx, gray wolf and bald eagle are monitored on an annual to five year basis. Information on gray wolf and bald eagle population trend indices is found in Section 2 of this Wildlife Resources section.
- Additionally, lynx monitoring and research is ongoing and reported in M&E reports and on SNF research partner's website: http://www.nrri.umn.edu/lynx/.

General Trends for Management Indicator Habitats 1-9 by Landscape Ecosystem (LE)

Tables 1-6 display monitoring of the actual MIH conditions for each Landscape Ecosystem as of November 2006 with a simple comparison to their Forest Plan objectives for the end of Decade 1 (2014). These tables highlight MIHs whose trends appear to currently be contrary to Landscape Ecosystem Objectives in this first decade of Plan implementation.

For all the following tables Forest Plan Objectives are for the end of Decade 1 (2014). Both the Forest Plan Objectives and the Trends are based on a comparison to the existing condition in 2004. ***Data source***: *Trend*; CDS and GIS frozen data Nov. 2006. *Objectives*; Respective references are shown for each table.

Table 1. JACK PINE-BLACK SPRUCE LE - MIH Objectives and Trends* + = Increase - = Decrease m = maintain shaded/bold cell = not moving toward FP Obj						
Management Indicator Habitat	**Young**		**Mature**		**Old/Older**	
	Plan Obj.	**2006 Trend**	**Plan Obj.**	**2006 Trend**	**Plan Obj.**	**2006 Trend**
1. Upland Forest	+	-	-	+	-	+
2. Upland Deciduous Forest	+	-	-	-	-	+
3. Upland Northern Hardwood Forest	-	-	+	**m**	m	m
4. Aspen / Birch Forest	+	-	-	-	-	+
5. Upland Conifer Forest	+	-	+	+	+	+
6. Spruce-Fir Forest	-	-	-	+	+	+
7. Red and White Pine Forest	-	-	+	+	+	+
8. Jack Pine Forest	+	-	+	+	-	+
Data source *Objectives*: FP p. 2- 63.						

Table 2. DRY-MESIC RED and WHITE PINE LE - MIH Objectives/Trends* + = Increase - = Decrease m = maintain shaded/bold cell = not moving toward FP Obj						
Management Indicator Habitat	**Young**		**Mature**		**Old/Older**	
	Plan Obj.	**2006 Trend**	**Plan Obj.**	**2006 Trend**	**Plan Obj.**	**2006 Trend**
1. Upland Forest	-	-	-	-	+	+
2. Upland Deciduous Forest	-	-	-	-	-	+
3. Upland Northern Hardwood Forest	+	**m**	-	+	m	m
4. Aspen / Birch Forest	-	-	-	-	-	+
5. Upland Conifer Forest	-	-	-	+	+	+
6. Spruce-Fir Forest	-	-	-	+	+	+
7. Red and White Pine Forest	-	-	-	+	+	+
8. Jack Pine Forest	+	-	+	+	-	-
Data source *Objectives*: FP p. 2- 66.						

Table 3. MESIC RED and WHITE PINE LE - MIH Objectives and Trends* + = Increase - = Decrease m = maintain shaded/bold cell = not moving toward FP Obj						
Management Indicator Habitat	**Young**		**Mature**		**Old/Older**	
	Plan Obj.	**2006 Trend**	**Plan Obj.**	**2006 Trend**	**Plan Obj.**	**2006 Trend**
1. Upland Forest	-	-	-	-	+	+
2. Upland Deciduous Forest	-	-	-	-	+	+
3. Upland Northern Hardwood Forest	m	m	-	+	+	**m**
4. Aspen / Birch Forest	-	-	-	-	+	+
5. Upland Conifer Forest	-	-	-	+	+	+
6. Spruce-Fir Forest	-	-	-	+	+	+
7. Red and White Pine Forest	-	-	+	+	+	+
8. Jack Pine Forest	m	-	-	+	-	**m**
Data source: *Objectives*: FP p. 2- 69.						

Table 4. MESIC BIRCH/ASPEN/SPRUCE-FIR LE MIH Objectives/Trends* + = Increase - = Decrease m = maintain shaded/bold cell = not moving toward FP Obj						
Management Indicator Habitat	**Young**		**Mature**		**Old/Older**	
	Plan Obj.	**2006 Trend**	**Plan Obj.**	**2006 Trend**	**Plan Obj.**	**2006 Trend**
1. Upland Forest	-	-	-	+	+	+
2. Upland Deciduous Forest	+	-	-	-	+	+
3. Upland Northern Hardwood Forest	+	**m**	-	-	+	+
4. Aspen / Birch Forest	+	-	-	-	+	+
5. Upland Conifer Forest	-	-	-	+	+	+
6. Spruce-Fir Forest	-	-	-	+	+	+
7. Red and White Pine Forest	-	+	+	+	+	**m**
8. Jack Pine Forest	+	-	-	**m**	-	+
Data source: *Objectives*: FP p. 2- 72.						

Table 5. SUGAR MAPLE LE - MIH Objectives and Trends* + = Increase - = Decrease m = maintain shaded/bold cell = Not moving toward FP Obj						
Management Indicator Habitat	**Young**		**Mature**		**Old/Older**	
	Plan Obj.	**2006 Trend**	**Plan Obj.**	**2006 Trend**	**Plan Obj.**	**2006 Trend**
1. Upland Forest	-	-	-	-	+	+
2. Upland Deciduous Forest	-	-	-	-	+	+
3. Upland Northern Hardwood Forest	-	-	-	+	+	+
4. Aspen / Birch Forest	-	-	-	-	+	+
5. Upland Conifer Forest	-	-	m	+	+	+
6. Spruce-Fir Forest	-	-	-	+	+	-
7. Red and White Pine Forest	+	**m**	+	**m**	m	m
8. Jack Pine Forest	m	+	+	**m**	m	m
Data source: *Objectives*: FP p. 2- 75. .						

Table 6. LOWLAND CONIFER LE (All Lowland Conifer LEs LLC-A, LLC-B, LLC-C) - MIH Objectives and Trends* + = Increase - = Decrease shaded/bold cell = not moving toward FP Obj						
Management Indicator Habitat	**Young**		**Mature**		**Old/Older**	
	Plan Obj.	**2006 Trend**	**Plan Obj.**	**2006 Trend**	**Plan Obj.**	**2006 Trend**
9. Lowland Black Spruce-Tamarack	+	-	-	+	+	+
Data source: *Objectives*: FP p. 2- 77.						

Percent Change of Management Indicator Habitat 1: Upland Forest by LE

MIH 1 is examined in more detail because it is an overarching habitat that encompasses all upland MIHs and upland forest types: aspen; birch; spruce; balsam fir; northern hardwoods; and red, white and jack pine. Data is shown as a percentage instead of just trend by age class for each LE. As a "catch-all" upland MIH, gives a broad indication of habitat conditions. Despite being the coarsest upland habitat filter, many associated species seek the similar habitat composition and structure features of young, mature and older stages offered by MIH 1 instead of focusing on a particular forest species component. These are described generally in the Forest Plan EIS (p. 3.3.1-3-4). For example all young forest MIHs may share habitat features of having small seedlings, open canopy,

disturbed ground and distinct mixtures of plant and animal species. Mature and older forest MIHs share habitat attributes such as large and old trees, multiple layers of tree and shrub vegetation, and moderate to closed canopy.

Evaluation and Conclusions

General Trends for Management Indicator Habitats 1-9 by Landscape Ecosystem (LE)

For most of the MIHs, conditions are trending toward Forest Plan objectives and Forest Plan EIS expected conditions analyzed in EIS Chapter 3.3.1. Therefore, management actions in the first two years of implementation for these MIHs are consistent with Forest Plan direction and the extent to which conditions are moving toward objectives is acceptable. (See Appendix D for data on degree of change since 2004.) The conclusions of the Forest Plan EIS about the effect of management on these MIHs and their associated species also remain valid: the amount and distribution by Landscape Ecosystem of MIHs is adequately representative of those habitats that would have been expected under the range of natural variability of SNF ecosystems and therefore, current implementation of the Forest Plan is expected to maintain the desired diversity and viability of native and desired non-native species.

However, there are MIHs where current trends are not moving toward LE objectives for the first decade of Forest Plan implementation. The section below summarizes those trends and then provides evaluation and conclusions to assess reasons and identify any concerns.

Young/Seedling/Open Young Forest MIHs

Jack Pine-Black Spruce LE:

All the following MIHs are decreasing rather than increasing as desired:

- MIH 1: Upland Forest
- MIH 2: Upland Deciduous Forest
- MIH 4: Aspen-Birch Forest
- MIH 5: Upland Conifer Forest
- MIH 8: Jack Pine Forest

Dry-mesic Red and White Pine:

- MIH 3: Northern Hardwood Forest is not increasing as desired. However, since the actual desired increase in MIH 3 is from zero to only 100 acres and would comprise such a small fraction of the total acres in the LE (128,000 acres), this is negligible and does not constitute a concern at Year 2 of implementation.

Mesic Red and White Pine:

- MIH 8: Jack Pine Forest is decreasing rather than increasing as desired.

Mesic Birch/Aspen/Spruce-Fir

- MIH 2: Upland Deciduous Forest is decreasing rather than increasing as desired
- MIH 3: Northern Hardwood Forest is maintaining rather than increasing as desired
- MIH 7: Red and White Pine Forest is increasing rather than decreasing as desired
- MIH 8: Jack Pine Forest is decreasing rather than increasing as desired

Sugar Maple

- MIH 7: Red and White Pine Forest is maintaining rather than increasing as desired.
- MIH 8: Jack Pine Forest is increasing rather than maintaining as desired.

Lowland Conifer

- MIH 9: Lowland Black Spruce- Tamarack Forest is decreasing rather than increasing as desired.

Although most Objectives for Young Forest are moving in the direction of Forest Plan objectives, it is important, even in Year 2 of a 10-Year Plan, to consider why some MIHs are not. No obvious factor or problem with implementability related to wildlife habitat needs can be singled out.

However, in general, tracking and analyzing the conditions of Young stages of MIHs can be confusing for several reasons:

- Since 2006 is just Year 2 of Plan implementation, the SNF expects that the acres contributing to the objectives would be relatively small compared to acres that would be managed over the first decade. Most vegetation management projects that create young forest (primarily through timber harvest) have not yet been implemented. This helps account for the "shortage" in young MIHs at Year 2.
- All acres of young that existed in 2004 will grow into the Sapling/Pole stage by the end of the first decade (2014). Therefore desired acres of young will come from vegetation treatments that would occur after 2004. This means that as young MIHs in the 2004 Existing Condition grow, young MIH acres will decrease to reflect their succession into the pole/sapling stage. While the Forest Plan calls for replacement of young MIHs, there is likely not yet an even tradeoff of new young MIHs with the 2004 MIHs that are continually growing out of the young stage.
- Current conditions represent actual conditions on the ground. The implementation date to harvest and set back a stand to the Young/Seedling/Open stage often occurs several years following the decision date to harvest. Factors such as local economics or weather may lead to treatments being delayed. Thus, 2006 on-the-ground conditions may not reflect the actions the Forest Service has taken to promote Young/Seedling/Open stage objectives in the first two years.
- Since the Revised Forest Plan was signed in 2004, several large vegetation management projects (such as Virginia, Dunka, Inga South, and Caribou) that will create young MIHs have been approved. All the young MIHs planned and approved have not yet been created; therefore on-the-ground conditions may not reflect the actions the Forest Service has taken to promote Young/Seedling/Open stage objectives.
- To more closely examine the effect of projects to create young MIHs, see MIH 1analysis below and Appendix D of what 2006 conditions would look like if decisions had been implemented in 2006.

As the SNF proceeds further into Plan implementation, the on-the-ground "Current Conditions" are expected to better reflect this movement toward objectives.

The fact that young MIHs are not trending towards Forest Plan objectives does not present a detectable concern at this stage of Forest Plan implementation because of the reasons summarized above. Moreover, the current conditions fall within those analyzed under the range of alternatives in the Forest Plan FEIS analysis of effects to habitats and species associated with Young MIHs (Chapter 3.3.1). Although these MIHs are not yet at objective levels, they are within conditions under which associated species would maintain viability and well-distributed habitats. For example Alternatives B and D outlined in the Forest Plan Environmental Impact Statement (EIS) would have decreased young conditions within the Jack Pine-Black Spruce and Mesic Red and White Pine LE's to a level similar to reductions observed during the past two years of Forest Plan implementation. Despite this decrease, the amount of young habitat has not dropped below an unacceptable threshold that would present a concern for species viability.

Mature and Old/Old Growth and Multi-aged Forest MIHs

The following provides a summary of where current trends are not moving toward LE objectives for the first decade of Forest Plan implementation.

Jack Pine-Black Spruce:

Mature

- MIH 1: Upland Forest is increasing rather than decreasing as desired
- MIH 3: Northern Hardwood Forest is maintaining rather than increasing as desired
- MIH 6: Spruce-Fir Forest is increasing rather than decreasing as desired

Old/Old Growth/Multiaged

The following MIHs are increasing rather than decreasing as desired:

- MIH 1: Upland Forest
- MIH 2: Upland Deciduous Forest
- MIH 8: Jack Pine Forest

Dry-mesic Red and White Pine:

Mature

The following MIHs are increasing rather than decreasing as desired:

- MIH 3: Northern Hardwood Forest
- MIH 5: Upland Conifer Forest
- MIH 6: Spruce-Fir Forest
- MIH 7: Red and White Pine Forest

Old/Old Growth/Multiaged

The following MIHs are increasing rather than decreasing as desired:

- MIH 2: Upland Deciduous Forest
- MIH 4: Aspen/Birch Forest

Mesic Red and White Pine:

Mature

The following MIHs are increasing rather than decreasing as desired:

- MIH 3: Northern Hardwood Forest
- MIH 5: Upland Conifer Forest
- MIH 6: Spruce-Fir Forest
- MIH 8: Jack Pine Forest

Old/Old Growth/Multiaged

- MIH 3: Northern Hardwood Forest is maintaining rather than increasing as desired
- MIH 8: Jack Pine Forest is maintaining rather than decreasing as desired.

Mesic Birch/Aspen/Spruce-Fir

Mature

The following MIHs are increasing rather than decreasing as desired:

- MIH 1: Upland Forest
- MIH 5: Upland Conifer Forest
- MIH 6: Spruce-Fir Forest
- MIH 8: Jack Pine Forest is maintaining rather than decreasing as desired

Old/Old Growth/Multiaged

- MIH 7: Red and White Pine Forest is maintaining rather than increasing as desired.
- MIH 8: Jack Pine Forest is increasing rather than decreasing as desired.

Sugar Maple

Mature

The following MIHs are increasing rather than decreasing as desired:

- MIH 3: Northern Hardwood Forest
- MIH 5: Upland Conifer Forest
- MIH 6: Spruce-Fir Forest

  The following MIHs are maintaining rather than increasing as desired:
  - MIH 7: Red and White Pine Forest
  - MIH 8: Jack Pine Forest

Lowland Conifer

Mature

- MIH 9: Lowland Black Spruce- Tamarack Forest is increasing rather than decreasing as desired.

Most of the conditions in the mature and older MIHs show an increasing amount of habitat, contrary to objectives to decrease. These increases do not present a detectable concern at Year 2 of Forest Plan implementation for reasons similar to those discussed under young MIH stages with one additional factor. The difference is that the annual acres harvested for timber each of the past 2 years has been less than the projected annual timber harvest. Without harvest, mature and older forest remain old and mature and new younger stands are not created from these older stands. However, as projects approved in previous, pending, and future decisions are implemented, the SNF can expect trends to move toward objectives.

Similar to the discussion of young stands, the current conditions fall within those analyzed under the range of alternatives in the Forest Plan FEIS analysis of effects to habitats and species associated with mature and older MIHs (Chapter 3.3.1). Although these MIHs are not yet at levels identified as objectives, they are within conditions under which associated species would maintain viability and well-distributed habitats.

Percent Change of Management Indicator Habitat 1 (Upland Forest) by LE

Evaluation and conclusion in this section differs from MIHs 1-9 in that it includes MIH percent data (not just trend) as well as information on planned projects to better gauge extent of trends. Tables 7-11 and Figures 1-5 provide more detailed data for monitoring MIH 1 (Upland Forest) in each Landscape Ecosystem for two timeframes: 1) a "snapshot" of the actual vegetative habitat conditions as of November 2006 (a repeat of information in Section A above for MIH 1): and 2) an estimate of habitat conditions if all vegetation management projects for which there have been formal NEPA decisions approved by September 30, 2006 and assuming they would be implemented by 2014. These two timeframes are compared to: (a) conditions of the habitat indicators at the beginning of the planning period (2004); (b) Decade 1 objectives; and (c) conditions expected at the end of the first decade of plan implementation (Decade 1 projected conditions for 2114).

For all the following tables and graphs the following data sources were used: (1) *MIH conditions* in 2004 Forest Plan FEIS; (2) November 2006 CDS/ GIS frozen data; (3) 2006 Frozen Data + NEPA Decisions assuming all projects completed by 2014; and (4) 2014 Projected conditions from FP FEIS, Planning Record 3.3.1.1. #20124. Forest Plan objective references varied hence each table portrays respective objective(s).

Jack Pine-Black Spruce

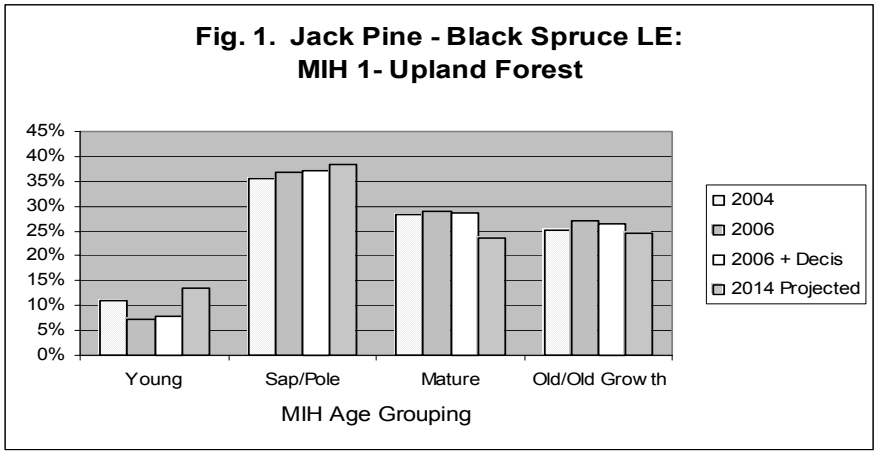

Table 7. Jack Pine-Black Spruce LE: MIH 1 Upland Forest											
Year	**Young**			**Pole**	**Mature**			**Old/OG**			**Mature+**
2004	10.9%			35.5%	23.8%			25.3%			49.1%
2006	7.3%			36.8%	28.8%			27.1%			55.9%
2006 + Decisions	7.9%			37.1%	28.5%			26.5%			55.0%
2014 Projected	13.5%			38.4%	23.5%			24.7%			48.2%
FP Decade	1	2	10	n/a	1	2	10	1	2	10	n/a
FP Objective	+	+	+		-	-	-	-	-	+	
Forest Plan Objectives: FP p. 2- 63.											

Young/Seedling/Open

1. MIH Consistency with Forest Plan Objectives: Although 2006 conditions show a decrease from 2004 and thus are not consistent with Forest Plan Decade 1objectives, when approved 2005 and 2006 decisions are fully implemented conditions do trend towards and are consistent with objectives.
2. MIH Consistency with Conditions Analyzed in Forest Plan FEIS: Conditions are consistent with those analyzed across the SNF for the range of alternatives in the FEIS, supported by detailed Landscape Ecosystem analysis in the Project Record.
3. Forest Plan FEIS Conclusions about species population trends, viability, and distribution: The FEIS concluded that the combination of young forest in all Landscape Ecosystems would provide a relatively high amount of young forest when the plan was fully implemented. Young habitat would remain greater than the amount of young forest that would have been expected under the range of natural variability. Thus populations of associated species would remain healthy, viable, and well-distributed.

Mature

1. MIH Consistency with Forest Plan Objectives: 2006 conditions are trending away from Forest Plan objectives with more mature forest than desired, but when 2005 and 2006 Decisions are factored in, conditions begin trending toward objective of less mature forest.
2. MIH Consistency with Conditions Analyzed in Forest Plan FEIS: Mature stage was not analyzed and documented by itself in the FEIS; it was combined with all other older classes.
3. Forest Plan FEIS Conclusions about species population trends, viability, and distribution: See Mature and Older below.

Old/Old Growth/Multi-aged

1. MIH Consistency with Forest Plan Objectives: 2006 conditions show an increase from 2004 and thus are not consistent with Forest Plan Decade1objectives, but when 2005 and 2006 decisions are included conditions begin trending toward objectives.
2. MIH Consistency with Conditions Analyzed in Forest Plan FEIS: This stage was not analyzed and documented by itself in the FEIS; it was combined with all other older classes.
3. Forest Plan FEIS Conclusions about species population trends, viability, and distribution: See Mature and Older below.

Mature and Older+

1. MIH Consistency with Forest Plan Objectives: Forest Plan does not have objectives for the combined mature and older classes. See Mature and Old/Old Growth/Multiaged above.
2. MIH Consistency with Conditions Analyzed in Forest Plan FEIS: Conditions are consistent with those analyzed Forest-wide for the range of alternatives in the FEIS, supported by detailed Landscape Ecosystem analysis in the Project Record.

3. Forest Plan FEIS Conclusions about species population trends, viability, and distribution: The FEIS concluded that the combination of mature and older forest in all Landscape Ecosystems under implementation of the Forest Plan would provide less mature and older forest than in 2004 or than would have been expected under the RNV. However, conditions would provide an adequate amount of representation of mature and older forest. Thus populations of associated species would remain viable and well-distributed.

Cumulative Effects for all ecological stages (age groups) of MIH 1.

- In the second year of implementation (2006), the SNF assumes that no significant unexpected change has occurred on non-NFS and therefore the conclusions about cumulative effects documented Forest-wide in the FEIS (Chapter 3.3.1-43 to -51) are assumed to remain valid.

Dry-Mesic Red and White Pine

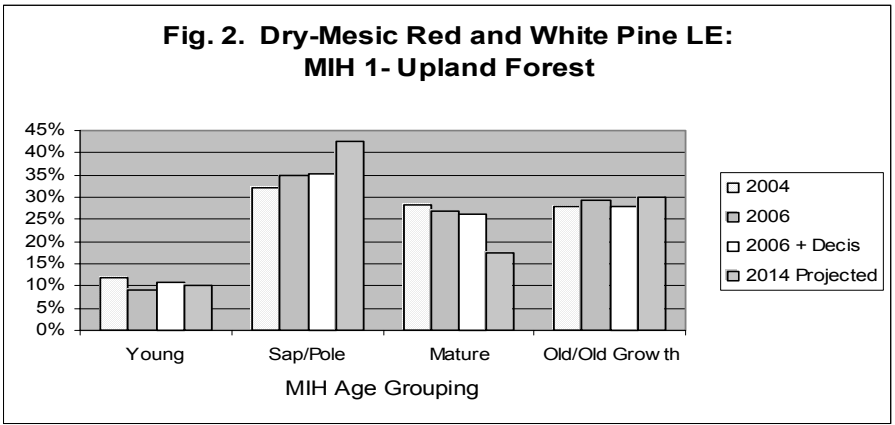

Table 8. Dry-Mesic Red & White Pine LE: MIH 1 Upland Forest											
Year	**Young**			**Pole**	**Mature**			**Old/OG**			**Mature+**
2004	11.7%			31.9%	28.4%			28.0%			56.4%
2006	9.1%			34.9%	26.8%			29.2%			56.0%
2006 + Decisions	10.8%			35.2%	26.0%			27.9%			53.9%
2014 Projected	10.0%			42.6%	17.3%			30.1%			47.4%
FP Decade	1	2	10	n/a	1	2	10	1	2	10	n/a
FP Objective	-	-	-		-	-	-	+	+	+	
Objectives: FP p. 2- 69.											

Young/Seedling/Open

1. MIH Consistency with Forest Plan Objectives: 2006 conditions show a decrease from 2004 and thus are consistent with Forest Plan Decade 1 objectives. Though 2006 conditions, along with approved decisions that have not been implemented yet, show that the amount of young would increase slightly above 2014 projected conditions. These conditions are still consistent with objectives since all of 2004 acres will grow out of the young stage and to trend toward objectives and are consistent with objectives.
2. MIH Consistency with Conditions Analyzed in Forest Plan FEIS: Conditions are consistent with those analyzed Forest-wide for the range of alternatives in the FEIS, supported by detailed Landscape Ecosystem analysis in the Project Record.
3. Forest Plan FEIS Conclusions about species population trends, viability, and distribution: The FEIS concluded that the combination of young forest in all Landscape Ecosystems under implementation of the Forest Plan would provide a relatively high amount of young forest. Young habitat would remain greater than the amount of young forest that would have been expected under the range of natural variability. Thus populations of associated species would remain healthy, viable, and well-distributed.

Mature

1. MIH Consistency with Forest Plan Objectives: When 2005 and 2006 approved Decisions are factored in, conditions are trending toward and thus are consistent with Forest Plan Decade 1 objectives.
2. MIH Consistency with Conditions Analyzed in Forest Plan FEIS: Mature stage was not analyzed and documented by itself in the FEIS; it was combined with all other older classes.
3. Forest Plan FEIS Conclusions about species population trends, viability, and distribution: See Mature and Older below.

Old/Old Growth/Multi-aged

1. MIH Consistency with Forest Plan Objectives: 2006 conditions are trending toward and thus are consistent with objectives. However, when approved but not yet implemented 2005 and 2006 decisions are included, conditions would not trend toward or be consistent with objectives. The extent of the differences is minor, but it will continue to be important to track and assess growth of mature forest into this older stage.
2. MIH Consistency with Conditions Analyzed in Forest Plan FEIS: Old/old growth stage was not analyzed and documented by itself in the FEIS; it was combined with all other older classes.
3. Forest Plan FEIS Conclusions about species population trends, viability, and distribution: See Mature and Older below.

Mature and Older+

4. MIH Consistency with Forest Plan Objectives: Forest Plan does not have objectives for the combined mature and older classes. See Mature and Old/Old Growth/Multiaged above.
5. MIH Consistency with Conditions Analyzed in Forest Plan FEIS: Conditions are consistent with those analyzed Forest-wide for the range of alternatives in the FEIS, supported by detailed Landscape Ecosystem analysis in the Project Record.
6. Forest Plan FEIS Conclusions about species population trends, viability, and distribution: The FEIS concluded that the Forest Plan would result in less mature and older forest than in 2004 or than would have been expected under the RNV. However, conditions would provide an adequate amount of representation of mature and older forest. Thus populations of associated species would remain viable and well-distributed.

Cumulative Effects for all ecological stages (age groups) of MIH 1.

- No additional information is available on cumulative effects from actions on non-NFS lands that is different from assumptions made in the FEIS. In the second year of implementation (2006), the SNF assumes that no significant unexpected change has occurred on non-NFS and therefore the conclusions about cumulative effects documented in the FEIS (Chapter 3.3.1-43 to -51) are assumed to remain valid.

Mesic Red and White Pine

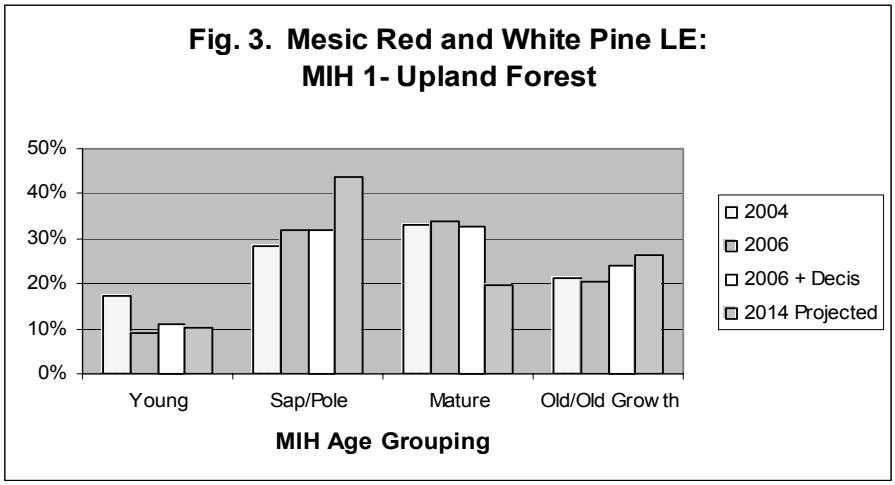

Table 9. Mesic Red & White LE: MIH 1: Upland forest											
Year	**Young**			**Pole**	**Mature**			**Old/OG**			**Mature+**
2004	17.3%			28.5%	32.9%			21.3%			54.2%
2006	9.1%			31.8%	34.0%			20.6%			54.6%
2006 + Decisions	11.1%			32.0%	32.8%			24.1%			56.9%
2014 Projected	10.1%			43.9%	19.6%			26.5%			46.1%
Decade	1	2	10	n/a	1	2	10	1	2	10	n/a
FP Objective	-	-	-		-	-	-	+	+	+	
Objectives: FP p. 2-69.											

Young/Seedling/Open

1. MIH Consistency with Forest Plan Objectives: 2006 conditions and 2006 conditions with Decisions show a decrease from 2004 and thus are trending toward and consistent with Forest Plan Decade 1objectives.
2. MIH Consistency with Conditions Analyzed in Forest Plan FEIS: Conditions are consistent with those analyzed Forest-wide for the range of alternatives in the FEIS, supported by detailed Landscape Ecosystem analysis in the Project Record.
3. Forest Plan FEIS Conclusions about species population trends, viability, and distribution: The FEIS concluded that the combination of young forest in all Landscape Ecosystems under implementation of the Forest Plan would provide a relatively high amount of young forest. Young habitat would remain greater than the amount of young forest that would have been expected under the range of natural variability. Thus populations of associated species would remain healthy, viable, and well-distributed.

Mature

1. MIH Consistency with Forest Plan Objectives: 2006 conditions show an increase in percent and thus are not trending toward or consistent with Forest Plan Decade 1 objectives. However, 2006 with Decisions conditions begin a very minor trend toward being consistent with objectives.
2. MIH Consistency with Conditions Analyzed in Forest Plan FEIS: Mature stage was not analyzed and documented by itself in the FEIS: it was combined with all other older classes.
3. Forest Plan FEIS Conclusions about species population trends, viability, and distribution: See Mature and Older below.

Old/Old Growth/Multi-aged

1. MIH Consistency with Forest Plan Objectives: 2006 conditions are not trending toward or consistent with Forest Plan Decade 1 objectives. However, 2006 with Decisions conditions begin trending toward and thus are begin to become consistent with objectives.
2. MIH Consistency with Conditions Analyzed in Forest Plan FEIS: Old/old growth stage was not analyzed and documented by itself in the FEIS: it was combined with all other older classes.
3. Forest Plan FEIS Conclusions about species population trends, viability, and distribution: See Mature and Older below.

Mature and Older+

1. MIH Consistency with Forest Plan Objectives: Forest Plan does not have objectives for the combined mature and older classes. See Mature and Old/Old Growth/Multiaged above.
2. MIH Consistency with Conditions Analyzed in Forest Plan FEIS: Conditions are consistent with those analyzed Forest-wide for the range of alternatives in the FEIS, supported by detailed Landscape Ecosystem analysis in the Project Record.
3. Forest Plan FEIS Conclusions about species population trends, viability, and distribution: The FEIS concluded that the Forest Plan would result in less mature and older forest than in 2004 or than would have been expected under the RNV. However, conditions would provide an adequate amount of representation

of mature and older forest. Thus populations of associated species would remain viable and well-distributed.

Cumulative Effects for all ecological stages (age groups) of MIH 1.

- In the second year of implementation (2006), the SNF assumes that no significant unexpected change has occurred on non-NFS and therefore the conclusions about cumulative effects documented Forest-wide in the FEIS (Chapter 3.3.1-43 to -51) are assumed to remain valid.

Mesic Birch/Aspen/Spruce-Fir

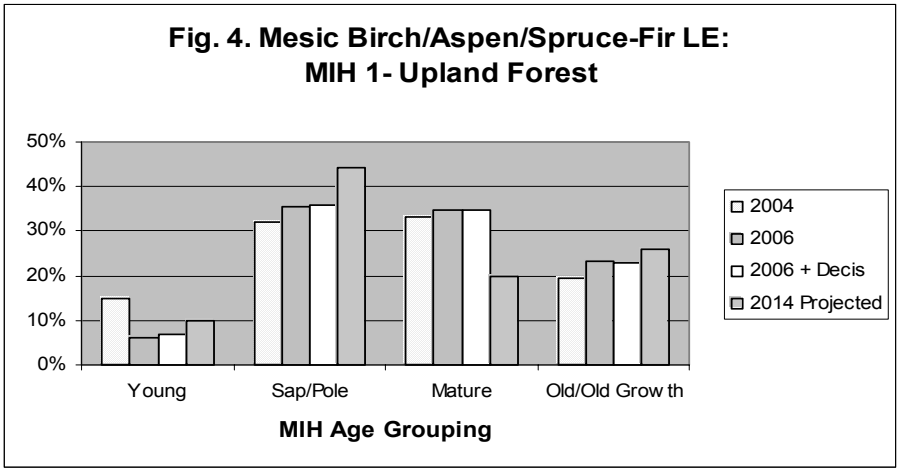

Table 10. Mesic Birch/Aspen/Spruce-Fir LE: MIH 1: Upland forest											
Year	Young			Pole	Mature			Old/OG			Mature+
2004	14.8%			32.0%	33.2%			19.3%			52.5%
2006	6.3%			35.6%	34.9%			23.2%			58.1%
2006 + Decisions	6.8%			35.7%	34.6%			22.9%			57.5%
2014 Projected	10.1%			44.4%	19.9%			25.9%			45.8%
Decade	1	2	10	n/a	1	2	10	1	2	10	n/a
FP Objective	-	-	-		-	-	-	+	+	+	
Objectives: FP p. 2-72.											

Young/Seedling/Open

1. MIH Consistency with Forest Plan Objectives: When approved 2005 and 2006 decisions are fully implemented there is a decrease from 2004 which is trending toward and consistent with Forest Plan Decade 1objectives.
2. MIH Consistency with Conditions Analyzed in Forest Plan FEIS: Conditions are consistent with those analyzed across the SNF for the range of alternatives in the FEIS, supported by detailed Landscape Ecosystem analysis in the Project Record.
3. Forest Plan FEIS Conclusions about species population trends, viability, and distribution: The FEIS concluded that the combination of young forest in all Landscape Ecosystems under implementation of the Forest Plan would provide a relatively high amount of young forest. Young habitat would remain greater than the amount of young forest that would have been expected under the range of natural variability. Thus populations of associated species would remain healthy, viable, and well-distributed.

Mature

1. MIH Consistency with Forest Plan Objectives: When approved 2005 and 2006 decisions are fully implemented there would be an increase in percent which is not trending toward or consistent with Forest

Plan Decade 1 objectives. However future projects should create young forest from this age group to move toward objectives for young, while some of these acres should provide for older forest objectives.

2. MIH Consistency with Conditions Analyzed in Forest Plan FEIS: Mature stage was not analyzed and documented by itself in the FEIS: it was combined with all other older classes.
3. Forest Plan FEIS Conclusions about species population trends, viability, and distribution: See Mature and Older below.

Old/Old Growth/Multi-aged

1. MIH Consistency with Forest Plan Objectives: When approved 2005 and 2006 decisions are fully implemented, there would be an increase thus a trending toward and consistency with Forest Plan Decade 1 objectives.
2. MIH Consistency with Conditions Analyzed in Forest Plan FEIS: Old/old growth stage was not analyzed and documented by itself in the FEIS: it was combined with all other older classes.
3. Forest Plan FEIS Conclusions about species population trends, viability, and distribution: See Mature and Older below.

Mature and Older+

1. MIH Consistency with Forest Plan Objectives: Forest Plan does not have objectives for the combined mature and older classes. See Mature and Old/Old Growth/Multiaged above.
2. MIH Consistency with Conditions Analyzed in Forest Plan FEIS: Conditions are consistent with those analyzed Forest-wide for the range of alternatives in the FEIS, supported by detailed Landscape Ecosystem analysis in the Project Record.
3. Forest Plan FEIS Conclusions about species population trends, viability, and distribution: The FEIS concluded that the Forest Plan would result in less mature and older forest than in 2004 or than would have been expected under the RNV. However, conditions would provide an adequate amount of representation of mature and older forest. Thus populations of associated species would remain viable and well-distributed.

Cumulative Effects for all ecological stages (age groups) of MIH 1.

- In the second year of implementation (2006), the SNF assumes that no significant unexpected change has occurred on non-NFS and therefore the conclusions about cumulative effects documented Forest-wide in the FEIS (Chapter 3.3.1-43 to -51) are assumed to remain valid.

Sugar Maple

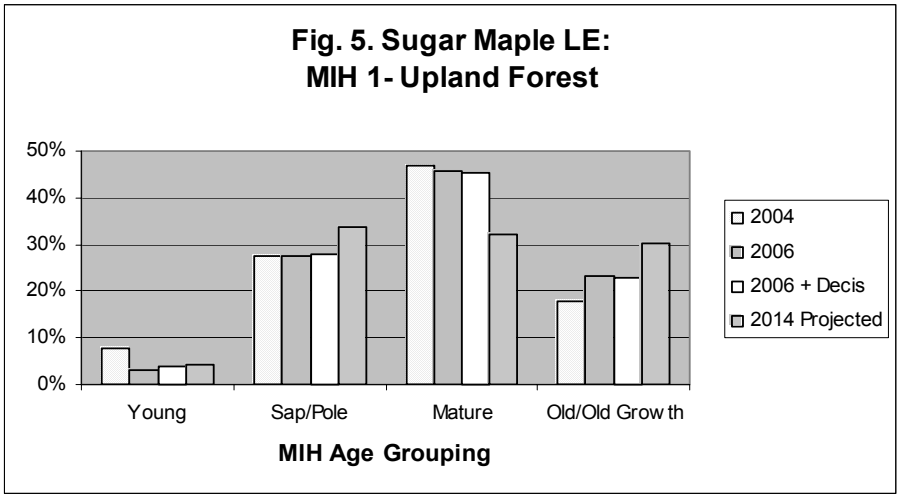

Table 11. Sugar Maple LE: MIH 1: Upland forest											
Year	Young			Pole	Mature			Old/OG			Mature+
2004	7.7%			27.7%	46.8%			17.9%			64.7%
2006	3.3%			27.5%	45.8%			23.4%			69.2%
2006 + Decisions	3.9%			27.7%	45.4%			23.0%			68.4%
2014 Projected	4.1%			33.8%	32.2%			30.1%			62.3%
Decade	1	2	10	n/a	1	2	10	1	2	10	n/a
FP Objective	-	-	-		-	-	-	+	+	+	
Objectives: FP p. 2-75.											

Young/Seedling/Open

1. MIH Consistency with Forest Plan Objectives: 2006 conditions and 2006 conditions with Decisions show a decrease from 2004 and thus are trending toward and consistent with Forest Plan Decade 1objectives.
2. MIH Consistency with Conditions Analyzed in Forest Plan FEIS: Conditions are consistent with those analyzed Forest-wide for the range of alternatives in the FEIS, supported by detailed Landscape Ecosystem analysis in the Project Record.
3. Forest Plan FEIS Conclusions about species population trends, viability, and distribution: The FEIS concluded that the combination of young forest in all Landscape Ecosystems under implementation of the Forest Plan would provide a relatively high amount of young forest. Young habitat would remain greater than the amount of young forest that would have been expected under the range of natural variability. Thus populations of associated species would remain healthy, viable, and well-distributed.

Mature

1. MIH Consistency with Forest Plan Objectives: When approved 2005 and 2006 decisions are fully implemented there will be a slight decrease in percent and thus a trend away from Forest Plan Decade 1 objectives. However future projects should create young forest from this age group to move toward objectives for young, while some of these acres should provide for older forest objectives.
2. MIH Consistency with Conditions Analyzed in Forest Plan FEIS: Mature stage was not analyzed and documented by itself in the FEIS; it was combined with all other older classes.
3. Forest Plan FEIS Conclusions about species population trends, viability, and distribution: See Mature and Older below.

Old/Old Growth/Multi-aged

1. MIH Consistency with Forest Plan Objectives: When approved 2005 and 2006 decisions are fully implemented this will increase the percentage and thus trend toward and be consistent with Forest Plan Decade 1 objectives.
2. MIH Consistency with Conditions Analyzed in Forest Plan FEIS: Old/old growth stage was not analyzed and documented by itself in the FEIS; it was combined with all other older classes.
3. Forest Plan FEIS Conclusions about species population trends, viability, and distribution: See Mature and Older below.

Mature and Older+

1. MIH Consistency with Forest Plan Objectives: Forest Plan does not have objectives for the combined mature and older classes. See Mature and Old/Old Growth/Multiaged above.
2. MIH Consistency with Conditions Analyzed in Forest Plan FEIS: Conditions are consistent with those analyzed Forest-wide for the range of alternatives in the FEIS, supported by detailed Landscape Ecosystem analysis in the Project Record.
3. Forest Plan FEIS Conclusions about species population trends, viability, and distribution: The FEIS concluded that the Forest Plan would result in less mature and older forest than in 2004 or than would have been expected under the RNV. However, conditions would provide an adequate amount of representation of mature and older forest. Thus populations of associated species would remain viable and well-distributed.

Standards and Guides
Not applicable for MIHs 1-9.

Necessary Follow-up and Management Recommendations

- Continue to monitor MIH amounts and trends annually, but it may not be necessary to document the findings in the Monitoring and Evaluation Report annually. If not documented annually, make data available upon request.
- In future Monitoring and Evaluation reports an analysis could be conducted to compare the total acres planned or implemented in vegetation management project areas to the total acres suitable for vegetative treatment in each Landscape Ecosystem. This would allow a gauging of how likely the SNF is to meet Plan objectives by the end of the first decade if the SNF compared it to acres considered in each Landscape Ecosystem.
- At Year 5 MIH habitat amount should be linked to population trends for select species to test the Forest Plan coarse-filter hypothesis that management actions to increase or decrease the different growth stages of MIHs may affect population trends of associated species. This analysis should be done in partnership with the Natural Resources Research Institute and Minnesota DNR.

Collaborative Opportunities To Improve Efficiency And Quality Of Program

- It is important to continue to partner with Natural Resources Research Institute to monitor forest songbird population trends and their associations with MIHs.
- Other State and agency monitoring programs are also important to maintain.

Summary Conclusions

- The amount, spatial distribution, and trend of MIHs 1-9 were monitored primarily by measuring forest vegetation conditions.
- In 2006, the SNF maked the assumption that there has been no significant change in species' populations or to environmental impacts assessed through the Revised Forest Plan due to SNF management in the first two years of implementation.
- On an annual to five year basis the SNF and its partners are continuing to actively monitor or inventory a wide array of species including *(1) Breeding forest birds (2) Terrestrial game species (3) Frogs & Toads (4) NNIS (5) RFSS and (6) T&E Species.*
- For most of the MIHs, conditions are trending toward Forest Plan objectives and Forest Plan EIS expected conditions analyzed in EIS Chapter 3.3.1. Therefore, management actions in the first two years of implementation for these MIHs are consistent with Forest Plan direction and the extent to which conditions are moving toward objectives is acceptable.
- There are young, Mature and Old/Old Growth, and Multi-aged Forest MIHs where current trends are not moving toward LE objectives for the first decade of Forest Plan implementation but these increases do not present a detectable concern at Year 2 of Forest Plan implementation

Literature Cited:

Etterson, M., N. Danz, J.Lind, J.M.Hanowski, G.J. Niemi. Breeding bird monitoring in Great Lakes National Forests: 1991-2006. 2006. Natural Resources Research Institute Technical Report: NRRI/TR-2700/05. Available at http://www.nrri.umn.edu/mnbirds/reports/2006_AnnualReport.pdf